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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,289	09/08/2005	Alistair Chalmers Ramsay Brown	JMYS-124US	2954

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EXAMINER	
CHU, YONG LIANG	
ART UNIT	PAPER NUMBER
1626	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/31/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,289	BROWN, ALISTAIR CHALMERS RAMSAY	
	Examiner	Art Unit	
	Yong Chu	1626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *7 and 9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8* is/are rejected.

7)☒ Claim(s) *1* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/17/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim 8 is amended by the Amendment filed on 11 December 2006. Claims 1-9 are currently pending in the instant application.

Information Disclosure Statement

Applicant's Information Disclosure Statement, filed on 17 March 2005 has been considered. Please refer to Applicant's copy of the PTO-1449 submitted herewith.

Priority

This application is a 371 of PCT/GB03/03688 filed on 26 August 2003, and claims the benefit of UK Patent Application 0221489.8, filed on 17 September 2002.

Response to Lack of Unity

The response to the restriction request with election of Group I (claims 1-6 and 8) *without traverse* by Applicants' representative, Christopher R. Lewis dated on 11 December 2006, has been considered.

Group II (claims 7 and 9) will not be examined together with claims 1-6 and 8, even though claim 7 was amended to a dependent claim on claim 3, because claims 7 and 9 claim additional process of invention, which require additional search. It is a serious burden to Examiner to examine all the claims.

Status of the Claims

Claims 7 and 9 are withdrawn from further consideration by the Examiner due to restriction requirement dated on 8 November 2006 as being drawn to non-elected

inventions under 37 CFR 1.142(b). Therefore, claims 1-6, and 8 will be examined on the merits.

Claim Objections

Claim1 is objected to because of the following informalities: "aliphatic" should be added before alcohol. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "a period of time sufficient to provide from 0.2 to 10 kg sulfure (S) per ton of catalyst" is not defined the specification.

Claim Rejections - 35 USC § 102(b)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1- 5 are rejected under 35 U.S.C. 102 (b) as being anticipated by U.S. Patent No. 4,052,467 (Mills et al.).

Applicants' claims 1-5 relate to a process for the production of an aliphatic alcohol by the hydrogenation of an aliphatic aldehyde present in a feed stream containing an olefin over a catalyst comprising a copper compound, and a zinc compound comprising the step of treating said catalyst with an organic sulphur compound such as thiophene at a concentration of from 5 ppm to 150 ppm by weight.

Mills et al. disclose a process for the production of an aliphatic alcohol by hydrogenation of a C_7-aliphatic aldehyde present in a feed stream containing olefins over a catalyst comprising CuO-ZnO comprising the step of treating said catalyst with thiophene at a concentration of 0.05 weight percent (50 ppm) in Example II, column 3 of said patent.

EXAMPLE II

A catalytic cracker heptene fraction containing 63 percent total olefins and 0.05 weight percent sulfur as thiophene was hydroformylated to yield a mixture of aldehydes and alcohols. The hydroformylation reactor product was reduced over a 38 percent CuO — 72 percent (by weight) ZnO catalyst at 500° F., one liquid hourly space rate, 1000 psig, and two standard cubic feet of hydrogen per pound of feed. The aldehyde conversion was 98-99 percent and the catalyst was still active after a throughput of 1500 volumes of feed per volume of catalyst at which time the operation was terminated.

To illustrate the fact that at reaction conditions outside of the critical ranges, desulfurization of the feed and catalyst deactivation occurs, a feed containing 480 ppm of thiophene sulfur was passed over the catalyst of Example II at a pressure of 1000 psig and a temperature of 500° F. utilizing liquid hourly space rates of 0.5, 1.0, and 1.5. The sulfur content of the effluent from these three runs was 352, 393, and 459 ppm, respectively. This clearly demonstrates that the thiophene in the feed is decomposed and deposits sulfur on the catalyst inversely to the liquid hourly space rate and that there is very little decomposition of the thiophene and sulfur deposition when utilizing the temperature, pressure, and flow rate conditions required in the invention.

This prior art reads on the instant claims 1-5 of all the limitations.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 6 is rejected under 35 U.S.C. 103 (a) as unpatentable over U.S. Patent No. 4,052,467 (Mills et al.).

Applicant's instantly elected invention in claim 6 relate to a process for the production of an alcohol, comprising the steps of:

(a) reducing a catalyst bed provided within a reactor with a hydrogen-containing gas stream;

(b) feed to the bed of said reduced catalyst a gaseous feed stream comprising an aldehyde, a sulfur compound, and hydrogen for a period of time sufficient to provide from 0.2 to 10 kg of sulphur (S) per ton of

catalyst, wherein a concentration of said sulphur compound in said feed stream is less than 150 ppm; and

(c) subsequently feeding to said catalyst bed a feed stream containing no sulphur compound.

Determination of the scope and content of the prior art (MPEP §2141.01)

Mills et al. disclose a process for the production of an aliphatic alcohol by hydrogenation of a C_7-aliphatic aldehyde present in a feed stream containing olefins over a catalyst comprising CuO-ZnO comprising the step of treating said catalyst with thiophene at a concentration of 0.05 weight percent (50 ppm) in Example II, column 3 of said patent.

EXAMPLE II

A catalytic cracker heptene fraction containing 63 percent total olefins and 0.05 weight percent sulfur as thiophene was hydroformylated to yield a mixture of aldehydes and alcohols. The hydroformylation reactor product was reduced over a 38 percent CuO — 72 percent (by weight) ZnO catalyst at 500° F., one liquid hourly space rate, 1000 psig, and two standard cubic feet of hydrogen per pound of feed. The aldehyde conversion was 98-99 percent and the catalyst was still active after a throughput of 1500 volumes of feed per volume of catalyst at which time the operation was terminated.

To illustrate the fact that at reaction conditions outside of the critical ranges, desulfurization of the feed and catalyst deactivation occurs, a feed containing 480 ppm of thiophene sulfur was passed over the catalyst of Example II at a pressure of 1000 psig and a temperature of 500° F. utilizing liquid hourly space rates of 0.5, 1.0, and 1.5. The sulfur content of the effluent from these three runs was 352, 393, and 459 ppm, respectively. This clearly demonstrates that the thiophene in the feed is decomposed and deposits sulfur on the catalyst inversely to the liquid hourly space rate and that there is very little decomposition of the thiophene and sulfur deposition when utilizing the temperature, pressure, and flow rate conditions required in the invention.

Mills et al. also disclose in the same reference a broad aspect of the invention on line 47-70 column 1 through line 53 column 2, a process for the production of an aliphatic alcohol by hydrogenation of an aliphatic aldehyde. The step (a) of claim 6 is disclosed over the process described on line 14 through line 25, column as follows:

> can be utilized. The catalyst is reduced in H_2 or CO at a temperature in the range of about 400° to 500° F. for at least several hours. While reduction of the catalyst prior to use in the aldehyde reduction is preferred, it may be reduced during the process of conversion of the aldehyde to the alcohol. In the reduction of the catalyst, either H_2 or CO reduction may be utilized, alone, in admixture, and mixed with an inert diluent such as steam, nitrogen, combustion gas, etc., Nitrogen is the preferred diluent. The catalyst composite generally is pelleted prior to reduction and use.

The step (b) of claim 6 is disclosed over the process described in Example II for the production of an aliphatic alcohol by hydrogenation of a C_7-aliphatic aldehyde present in a feed stream containing olefins over a catalyst comprising CuO-ZnO comprising the step of treating said catalyst with thiophene at a concentration of 0.05 weight percent (50 ppm).

Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)

The difference between the prior art and the instant claims is that the prior art does not teach step (c) of claim 6, as subsequently feeding to said catalyst bed a feed stream containing no sulphur compound.

Finding of prima facie obviousness - rationale and motivation (MPEP § 2142-2413)

It would have been obvious to succeed the process for one having ordinary skill in the art at the time the invention was made to add the step (c) of claim 6, in view of the broad aspect of the invention on line 47-70 column 1 through line 53 column 2. The

process teaches a production of an aliphatic alcohol by hydrogenation of an aliphatic aldehyde using an open-ended transition phase "comprising" to suggest possible further steps in the process.

The test for obviousness does not require an explicit suggestion in a reference to sought to be combined, but may be found in ant number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself. See *DyStar Textifarben GmbH & Co. Deutschland KG v. C.H. Patrick Co., No. 06-1088* (Fed. Cir. Oct. 3, 2006).

Claim 8 is rejected under 35 U.S.C. 103 (a) as unpatentable over U.S. Patent No. 4,052,467 (Mills et al.).

Applicant's instantly elected invention in claim 8 relate to a process for the production of an alcohol according to claim 1, wherein the catalyst further comprises at least one of a catalyst support and a promoter compounds.

Determination of the scope and content of the prior art (MPEP §2141.01)

Mills et al. disclose a process for the production of an aliphatic alcohol by hydrogenation of a C_7-aliphatic aldehyde present in a feed stream containing olefins over a catalyst comprising CuO-ZnO comprising the step of treating said catalyst with thiophene at a concentration of 0.05 weight percent (50 ppm) in Example II, column 3 of said patent.

EXAMPLE II

A catalytic cracker heptene fraction containing 63 percent total olefins and 0.05 weight percent sulfur as thiophene was hydroformylated to yield a mixture of aldehydes and alcohols. The hydroformylation reactor product was reduced over a 38 percent CuO — 72 percent (by weight) ZnO catalyst at 500° F., one liquid hourly space rate, 1000 psig, and two standard cubic feet of hydrogen per pound of feed. The aldehyde conversion was 98-99 percent and the catalyst was still active after a throughput of 1500 volumes of feed per volume of catalyst at which time the operation was terminated.

To illustrate the fact that at reaction conditions outside of the critical ranges, desulfurization of the feed and catalyst deactivation occurs, a feed containing 480 ppm of thiophene sulfur was passed over the catalyst of Example II at a pressure of 1000 psig and a temperature of 500° F. utilizing liquid hourly space rates of 0.5, 1.0, and 1.5. The sulfur content of the effluent from these three runs was 352, 393, and 459 ppm, respectively. This clearly demonstrates that the thiophene in the feed is decomposed and deposits sulfur on the catalyst inversely to the liquid hourly space rate and that there is very little decomposition of the thiophene and sulfur deposition when utilizing the temperature, pressure, and flow rate conditions required in the invention.

Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)

The difference between the Mills reference and the instant claim is that the reference does not teach the catalyst used in process of claim 1 further comprising at least one of a catalyst support and a promoter compounds.

Finding of prima facie obviousness - rationale and motivation (MPEP § 2142-2413)

It would have been obvious to succeed for one having ordinary skill in the art at the time the invention was made to using a catalyst in the process of claim 1 further comprising at least one of a catalyst support and a promoter compounds. Such a catalyst support and a promoter compounds is not non-obviousness to one skilled in the art, as admitted in paragraph [0016] of the instant specification as " The catalyst may,

optionally, also include a support material and/or promoter compounds". The test for obviousness does not require an explicit suggestion in a particular reference to combine references, *DyStar Textifarben GmbH & Co. Deutschland KG v. C.H. Patrick Co., No. 06-1088* (Fed. Cir. Oct. 3, 2006).

Conclusion

No claims are allowed.

Telephone Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yong Chu whose telephone number is 571-272-5759. The examiner can normally be reached on 7:00 am - 3:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph McKane can be reached on 571-272-0699. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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